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EXAMINER	
DOAK, JENNIFER L	
ART UNIT	PAPER NUMBER
2872	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/567,259	YUKAWA ET AL.	
	Examiner	Art Unit	
	Jennifer L. Doak	2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 February 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 February 2006* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *See Continuation Sheet*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :2/6/06, 5/2/06, 10/5/06,4/11/07.

DETAILED ACTION

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the random distribution of the glass spheres in the thickness direction of the focusing layer must be shown or the feature(s) canceled from the claim(s). No new matter should be entered. Although this feature is somewhat shown in the intermediate process steps of Figs. 1A-1F, it is not shown as a final product, particularly in Fig. 7, which appears to be an intended depiction of the final product.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Figures 8A-8D should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: (14), (15), and (16). Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The drawings are objected to because Fig. 6B misspells "Night Time" with "Nihght." Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one

figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Objections

Claims 19-21 are objected to because the preamble statements of dependent claims should be consistent with the claim from which they depend. It appears that these claims are quasi-independent claims (i.e.: Claim 19 is directed to an external illumination system rather than to a retroreflective sheet), and should be rewritten as independent claims including all the limitations of the claim(s) from which they depend.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Background Art disclosure (hereinafter "Background") in view of Kashima et al. (US 6,333,817)(hereinafter "Kashima").

Regarding Claim 1, Applicant discloses as prior art, a retroreflective sheet comprising a surface layer including at least one layer, a focusing layer containing glass spheres, and a metal reflective layer on the back side of the focusing layer, wherein the glass spheres are disposed (para. [0002], [0012]). Applicant's prior art disclosure does not show that the spheres are disposed at random locations in the thickness direction of the focusing layer. Applicant's disclosed Prior Art and Kashima are analogous because both concern retroreflector sheets in which beads are disposed. Kashima teaches that the beads (20) are randomly disposed in the focusing layer (18) (Kashima, Fig. 2). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to randomly distribute the beads in the focusing layer, since randomizing the position of the beads to prevents interference fringes from other elements of the sheet and is economical.

Regarding Claims 2-5, Kashima further teaches the glass spheres include a glass sphere group B in contact with the surface layer, and a glass sphere group A located away from the surface layer and wherein the proportion of glass spheres in contact with the surface layer is from 50 to 90 wt % of the total glass spheres (Fig. 2; col. 8, lines 54-56). Kashima does not explicitly teach

> the glass sphere group A exhibits retroreflective performance at a larger observation angle than the observation angle of the glass sphere group B, or that the glass spheres include a glass sphere group B in contact with the surface layer, and a glass sphere group A located away from the surface layer, and the metal reflective layer of the glass sphere group B is formed at a focus formation position, the thickness of the focusing layer of the glass sphere group A is less than the thickness of the focusing layer of the glass sphere group B, and the glass sphere group A exhibits retroreflective performance at a relatively larger observation angle than the glass sphere group B; or that the glass spheres include a glass sphere group B in contact with the surface layer, and a glass sphere group A located away from the surface layer, and the focusing layer formed in the form of concentric circles on the glass sphere surfaces of the glass sphere group B has a thickness at which the maximum reflective performance is exhibited at an observation angle of 0.2.degrees and an incidence angle of 5.degree., the thickness of the focusing layer of the glass sphere group A is less than the thickness of the focusing layer of the glass sphere group B, and the glass sphere group A exhibits retroreflective performance at a relatively larger observation angle than the glass sphere group B.

However, these limitations are inherent to the structure previously recited, and the claim language is necessarily met by that structure. Absent a showing to the contrary, the features recited above would be met by the structure of the combined teachings of the prior art or would be met during use of the same.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Background Art disclosure (hereinafter "Background") in view of Kashima et al. (US 6,333,817)(hereinafter "Kashima") in further view of Searight (US 3,204,537).

Regarding Claim 6, the Background-Kashima combination does not explicitly disclose that the refractive index of the spheres ranges from 2.10 to 2.40. The Background and Searight are analogous art because they are both retroreflective devices for highways that use glass spheres. Searight discloses that the refractive index of the spheres can be 2.1 (col. 2, lines 37-41). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use glass beads with refractive index in the range of 2.1 to 2.4 in the

retro-reflective Background-Kashima combination, since changes in the refractive index can be used to adjust the reflective performance of the beads.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Background Art disclosure (hereinafter "Background") in view of Kashima et al. (US 6,333,817)(hereinafter "Kashima") in further view of Palmquist (US 3,014,409).

Regarding Claim 7, Kashima further discloses that at least 80% of the spheres have a median diameter within a range of .+-.10 . μ.m (col. 4, lines 37-38), but the Background-Kashima combination does not disclose that the glass spheres have a median diameter within a range of at least 35 .μ.m and no more than 75 μm. Background and Palmquist are analogous art because they are both retro-reflectors using glass beads. Palmquist teaches a diameter range of 25 to 75 μm. Therefore, absent a showing of criticality, it would have been obvious to one of ordinary skill in the art at the time the invention was made to limit the range of diameter of the spheres to the named range, since it could simplify the maintaining of consistency of the coating process.

Claims 8-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Background Art disclosure (hereinafter "Background") in view of Kashima et al. (US 6,333,817)(hereinafter "Kashima") in further view of Hedblom et al. (US 6,365,262)(hereinafter "Hedblom").

Regarding Claims 8-18, the Kashima further teaches the use of polymer resins, but does not expound into many specifics regarding further chemical composition, such as is claimed in Claims 8-18. Background, Kashima, and Hedblom are all analogous art because they all are directed to retro-reflective devices that contain beads in a resin layer. Hedblom does teach that

specific chemicals can be used, including polyvinyl acetal resin, polyvinyl butyral resin, olefin copolymers, polyester resins, alkyd resins, polyurethane resins, vinyl resins, and acrylic polymers (col. 7, lines 18-33; col. 9, lines 10-37; col. 10, lines 1-19). The weight relationships, transition point temperatures, solvent relationships, and related anti-foaming agents are not explicitly disclosed, but are well known in the art. Therefore, absent a showing of criticality, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the chemicals and the claimed relations, since they result in retro-reflectors that remain retro-reflective in wet or dry conditions.

Claims 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Background Art disclosure (hereinafter "Background") in view of Kashima et al. (US 6,333,817)(hereinafter "Kashima") in further view of Searight (US 3,204,537), or Palmquist (US 3,014,409), or, in the alternative, Hedblom et al. (US 6,365,262)(hereinafter "Hedblom").

The above listed combinations are listed only to indicate references to the above claims from which the following claims alternatively depend, but are not intended to be a new combination of references.

Regarding Claims 19-21, the invention is not disclosed to be joined with a light source as recited in these claims, and, thus, must be the manner in which the invention is used. The use then necessarily meets the recitation of the claims. For example, mercury car headlights are external illumination sources to the retro-reflective sheeting on a sign, and when the car passes, it passes through the range of 1m to 100m distance from the sign. The structure recited above in the claims from which these claims depend results in the reflectivity relations recited in Claims

19-21. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the reflective sheeting in this manner and expect these results, since these claims merely recite the intended use.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer L. Doak whose telephone number is 571-272-9791. The examiner can normally be reached on Mon-Thur: 7:30A-5:00P, Alt Fri: 7:30A-4:00P (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephone B. Allen can be reached on 571-272-2434. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JD

Stephone B. Allen
Supervisory Patent Examiner